



## ARL is an Authority on Nutrition and the Science of Balancing Body Chemistry Through Hair Tissue Mineral Analysis!

Hair Tissue Mineral Analysis


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# Protein Catabolism

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## Protein Catabolism

What is **"protein catabolism"**? Let us explore what this means and why it is so important to understand.

### Anabolism And Catabolism

Metabolism, the sum of the chemical processes of the body, may be divided into two phases.

**Anabolism** refers to chemical processes which are constructive, or synthesizing of body tissues, enzymes and other body components.

**Catabolism** generally refers to those processes in which body tissues and components are breaking down into simpler metabolic constituents.

These two processes always coexist, although one may dominate at times over the other. For example, at night during sleep, anabolic processes tend to dominate, while catabolism tends to dominate during the day. Childhood is a more anabolic time of life, while old age in general more catabolic.

### Causes Of Catabolism

Anabolism and catabolism can become quite involved. Dr. Emanuel Revici based an entire metabolic typing system on these two aspects of metabolism. His system is somewhat similar, but not the same as Dr. Paul Eck's distinction of fast and slow oxidizers.

When we refer to a catabolic state we are referring to a specific condition in which catabolic processes are dominant. The main cause of this is a prolonged stress response.

In response to stress, the body secretes epinephrine, norepinephrine, cortisol and other hormones. The glucocorticoids (such as cortisol) have a catabolic action. That is, they suppress the synthesis of protein, glycogen and triglycerides. Instead, these are broken down into fatty acids, glucose and amino acids and mobilized from storage.

This process is necessary to counteract a stress. However, if the process is prolonged, the resulting catabolism is very damaging to the body and causes excessive tissue breakdown.

Also, a prolonged stress response suppresses the immune system, the digestive organs, growth hormones and other important body systems.

There are numerous causes for a prolonged stress response. They include *attitudes* of fear, guilt, worry, resentment, frustration and hostility. Another cause is **nutritional deficiencies**. These can lower one's stress threshold and impair the production of cellular energy within the cells. When a body is not able to properly metabolize sugars, starches and fats for fuel in the glycolysis and Krebs energy cycles, it will digest its own tissue proteins in order to produce energy.

Also, fatigue and other health conditions may cause a catabolic state.

### Catabolism And Health

A catabolic or tissue breakdown state can affect any organ or body system, depending on one's particular weaknesses. For example, if excessive tissue breakdown occurs in the joints, the result may be painful joints or arthritis. If excessive tissue breakdown occurs in the stomach, the result may be an ulcer. If it is in the heart muscle, cardiomyopathy can result. Similarly, tissue breakdown can affect any organ or system.

Correction has less to do with the particular affected organ and more to do with reducing stress and improving cellular energy production so that the tendency for catabolism or cannibalizing tissue can be reversed. This involves dietary and lifestyle changes and the use of nutritional supplements to help restore energy production.

### The Sodium/Potassium Ratio

According to Dr. Paul Eck's research, a low hair sodium/potassium ratio is an indicator of a catabolic state. This is also referred to as *inverted ratio* or inversion. It is a chronic stress indicator. Dr. Eck determined that there are several reasons the ratio inverts:

- Aldosterone is associated with the tissue sodium level and with acute stress. Cortisol levels are more associated with the potassium level and with chronic stress. The inverted ratio (higher potassium in relation to sodium) occurs when the chronic stress hormone, cortisol, begins to become predominate.
- As cells are destroyed at a rapid rate, potassium is released from the cells, leading to an increase in the free potassium.

The lower the sodium/potassium ratio, the more severe the catabolic state.

Dr. Eck determined that a tendency for conditions such as carbohydrate intolerance, cardiovascular disease, impaired immune system, ulcers and arthritis exists when there is a low sodium/potassium ratio.

### Assessing The Sodium/Potassium Ratio

The assessment of the sodium/potassium ratio can be tricky. Other indicators on the hair test can affect the sodium and potassium levels. For example a cadmium toxicity may elevate the sodium level. Thus a person with an elevated cadmium level often has a sodium/potassium ratio lower than it appears to be. The levels of zinc, copper, calcium, magnesium and other elements can also affect the sodium and potassium levels.

Another finding is that low sodium/potassium ratios often are more common in fast oxidizers than in slow oxidizers. That is, when the calcium and magnesium levels are high (slow oxidation), the inverted sodium/potassium ratio is less frequently seen. As the oxidation rate increases, often the inversion become visible or worsens. This is interesting because slow oxidation is often a catabolic state. Perhaps the high calcium and magnesium protect against an inverted sodium/potassium ratio. Elevated calcium and magnesium levels may act as compensatory measures to reduce stress.

Another indicator of catabolism involves the tissue phosphorus level. Dr. Eck believed that a high phosphorus level is indicative of rapid protein breakdown, while a phosphorus level less than about 13 mg% indicates inadequate protein synthesis.

### Correcting A Catabolic State

Correction includes getting plenty of rest and sleep, learning to accept and trust what life brings and letting go of fears, guilt, worries and resentments. Diet can play an important role. Many people, for example, place great stress on the body by eating excessive carbohydrates and not enough protein.

Natural therapies may also be very beneficial. Specific supplements are often critical to raise the threshold for stress and help improve cellular energy production.

Often a multi mineral/vitamin product will be recommended for a catabolic state. A supplement that contains zinc, an important nutrient for protein synthesis and manganese, important for cellular energy production. In addition it should contain vitamins A and C, magnesium and vitamin B6. These are very important for energy production as well. Finally, it should contain copper which is important for the electron transport system, where most energy is produced. In addition, digestive enzymes are recommended to facilitate digestion and the absorption of nutrients.

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